

# The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States

*"Planning a Survey of the Nation's Lakes"*  
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# Economics: “the dismal science”

## Or not?



# 1930s and 1940s

- Aftermath of the Depression
- Labor turmoil
- Economic uncertainty: role of government?



And then things got really bad



- Economic statistics not a new art / science
- BUT: War and Depression major drivers of conceptual development
- How big is economy? How many people employed? How much trade?
- 1930s >> 1940s >> 1950s >> TODAY



# Economists ARE better off:

- Coherent integrated repeated reporting of a wide variety of economic stats
- Provided by trusted institutions with adequate resources
- Agreement on key indicators



**WHEREAS, in the environmental realm**

- No integrated top-to-bottom data system
- Insufficient well-trusted, well-resourced reporting entities
- No agreement on core indicators (but...)



# Some principles to consider

- If manage, need feedback
- Manage economy at national level
- Have developed tools for economic feedback
- Manage environment, ecosystems nationally
- Need capacity for fact-based discourse





# Heinz Center ??

## State of the Nation's Ecosystems ??

### GOAL:

- High level, widely accepted, science-based, periodically reported indicators of condition and use of US ecosystems

### STRATEGIES:

- Business, environmental, academic, gov't
- Focus on *state*
- Above politics, but relevant to policy
- Not limited to current data
- Iterative





- High level
- Widely accepted
- Science based
- Periodically reported
- Use and condition



# Development and Structure

Goal #1: Characterize major ecosystem types (fresh water, salt water, forests, grass/shrub, urban/suburban, farmlands)

Goal #2: Develop common framework across ecosystems



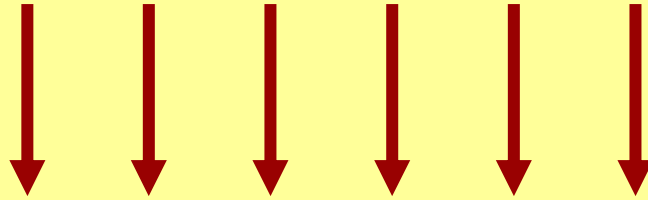
# Ten major characteristics

1. Extent
2. Fragmentation / pattern
3. Elements: C,N,O,P...
4. Contaminants
5. Physical matrix
6. Species
7. Communities
8. Ecosystems
9. Food, fiber, water
10. Recreation, services





# 2000: NRC: Ecological Indicators for the Nation



Core national indicators: *"Ten things you really should know about US ecosystems"*

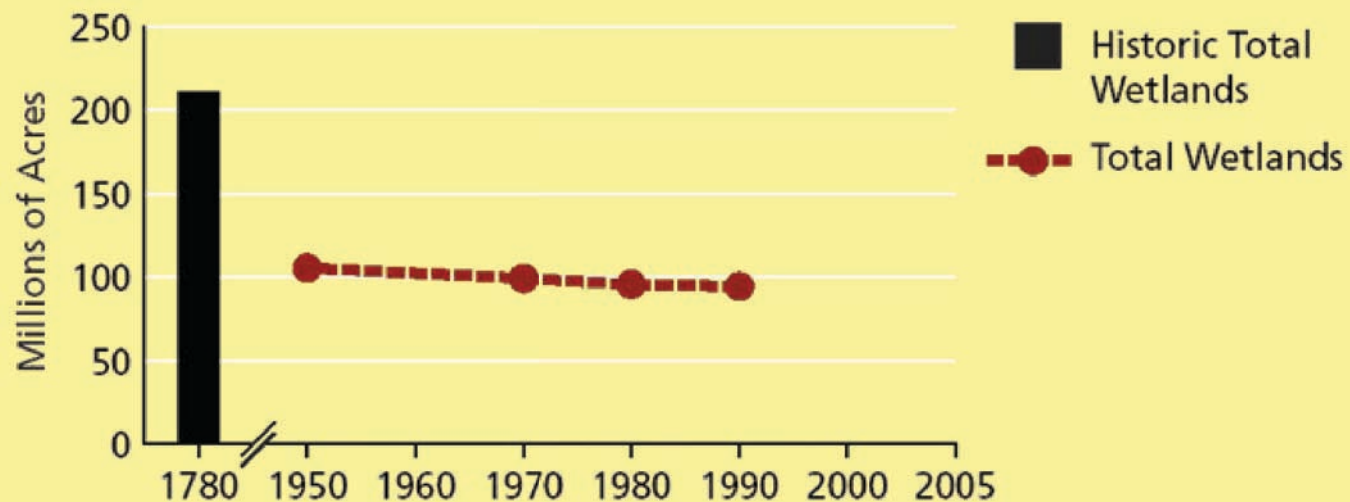


# Restate Strategy:

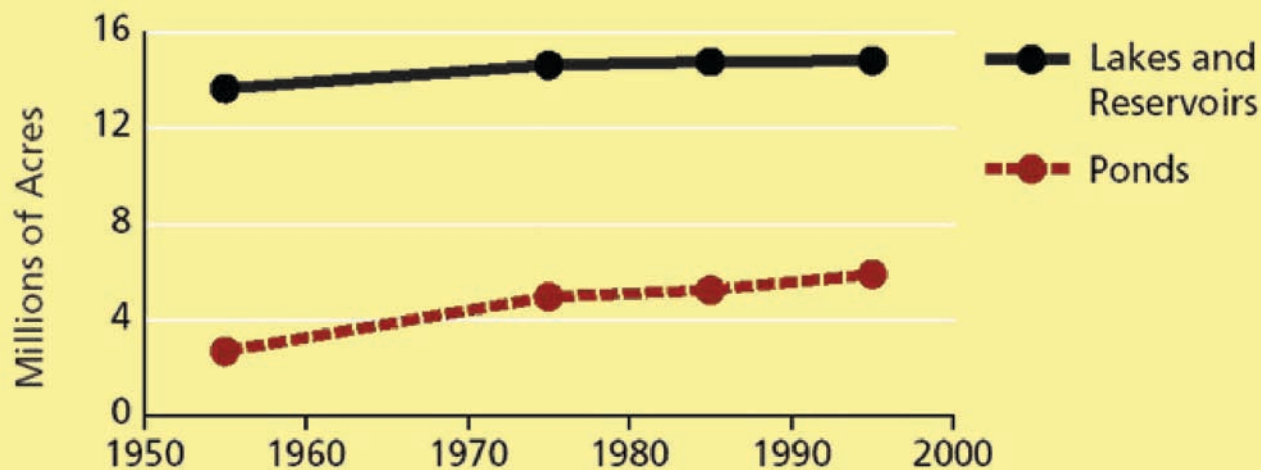
1. Worked with major ecosystem types
2. Developed common set of key attributes
3. Developed core indicators
4. Refine both sets



## Freshwater Wetlands

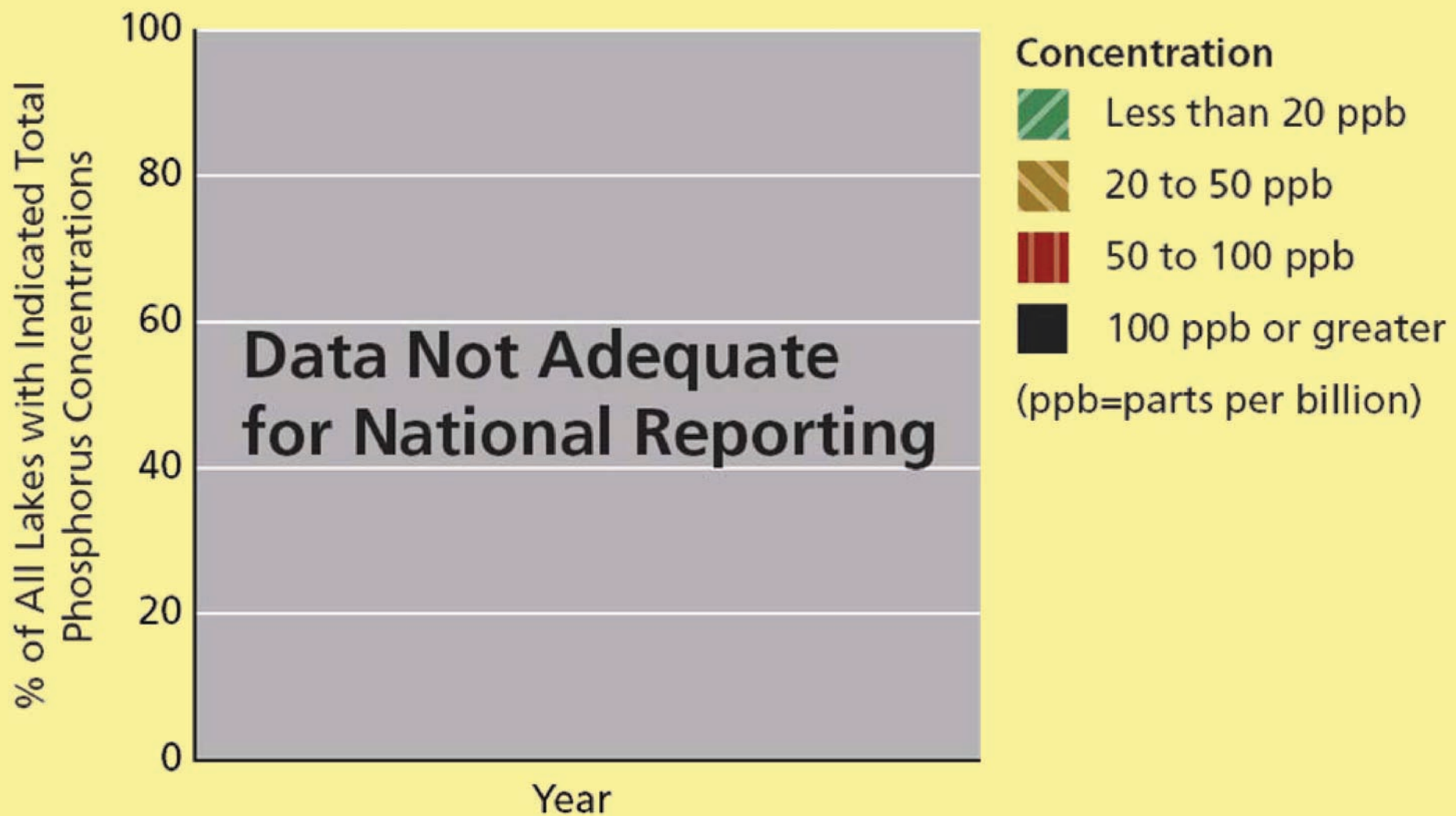


## Ponds, Lakes, and Reservoirs



*Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory (NWI); Coverage: lower 48 states. Lake area does not include the Great Lakes, which cover about 60.2 million acres within the United States.*

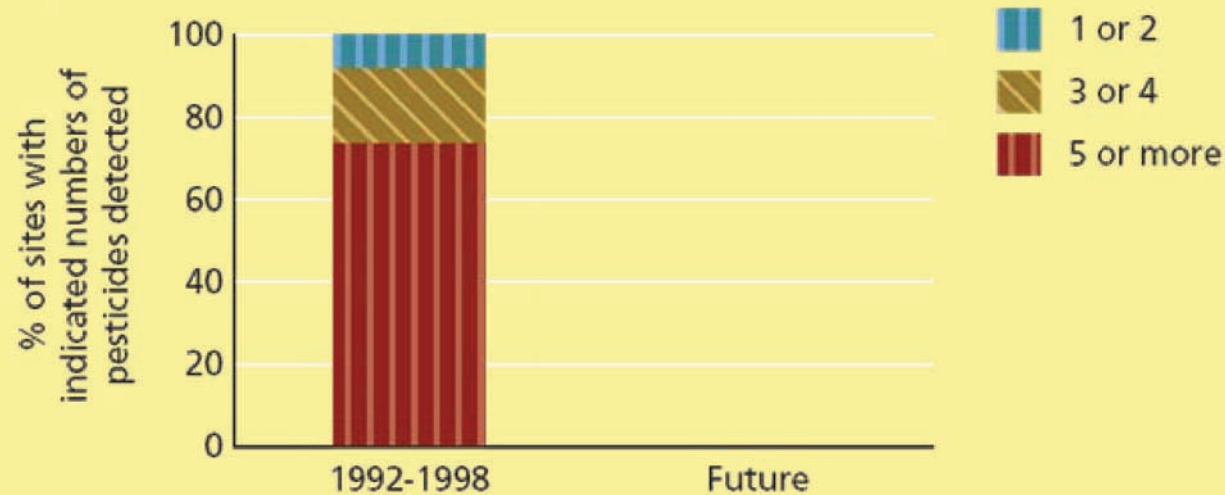
# Phosphorus in Lakes and Reservoirs



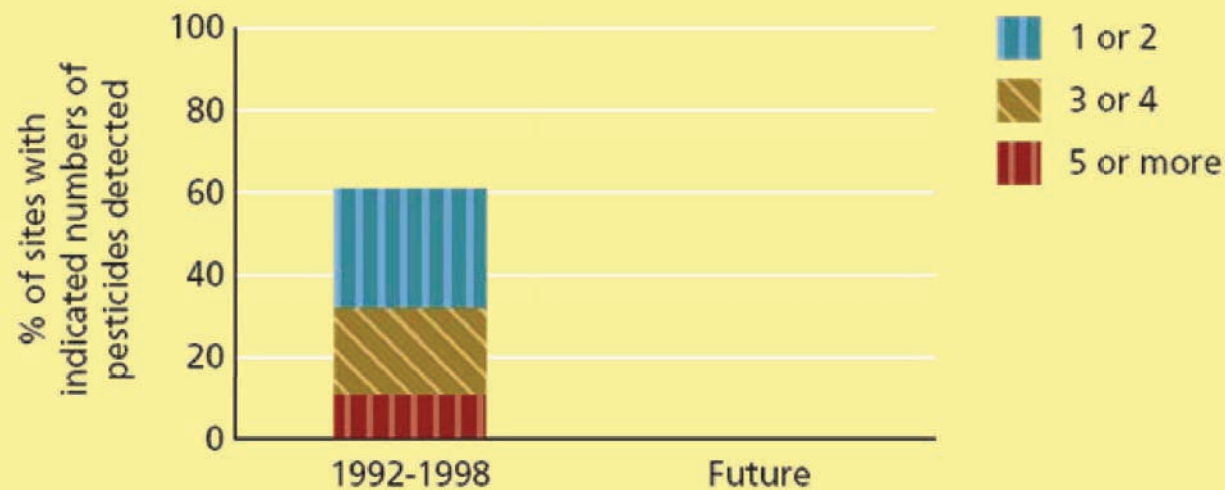


# Pesticide Occurrence

## Agricultural Streams



## Agricultural Groundwater



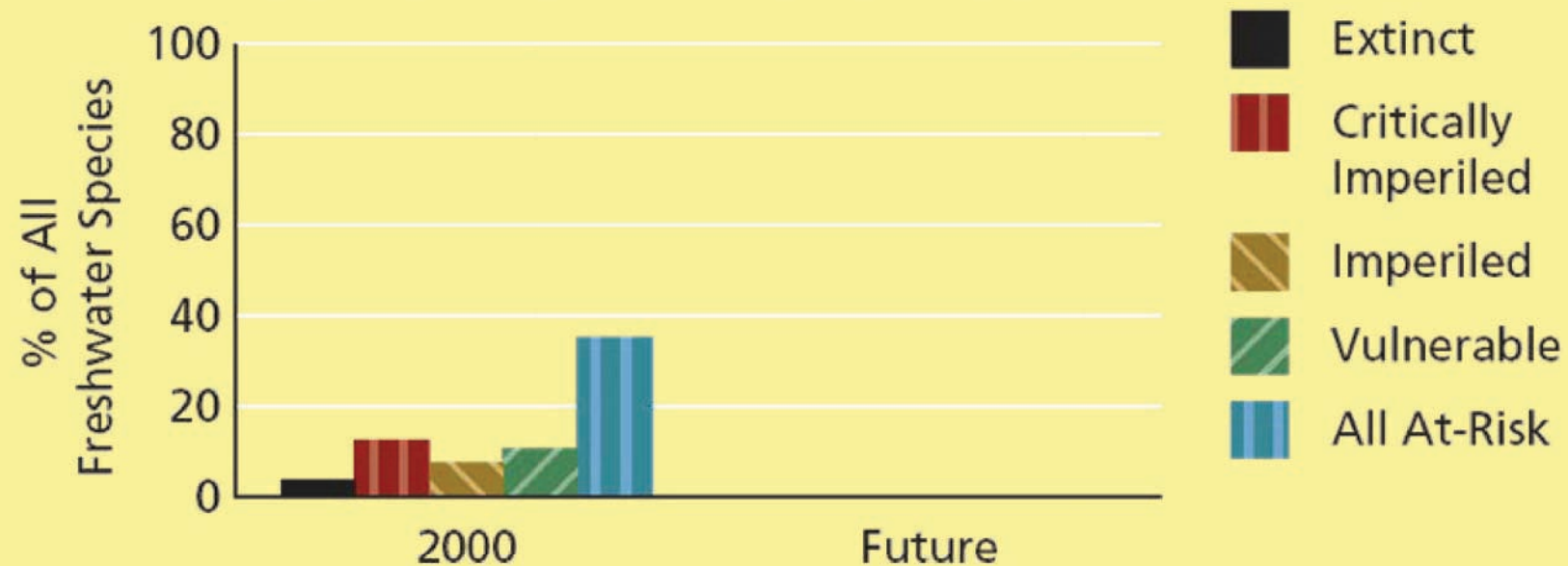
Data Source: U.S. Geological Survey National Water Quality Assessment Program (NAWQA). Coverage: lower 48 states.

# At-Risk Species, by Risk Category

## Data Not Adequate for National Reporting on

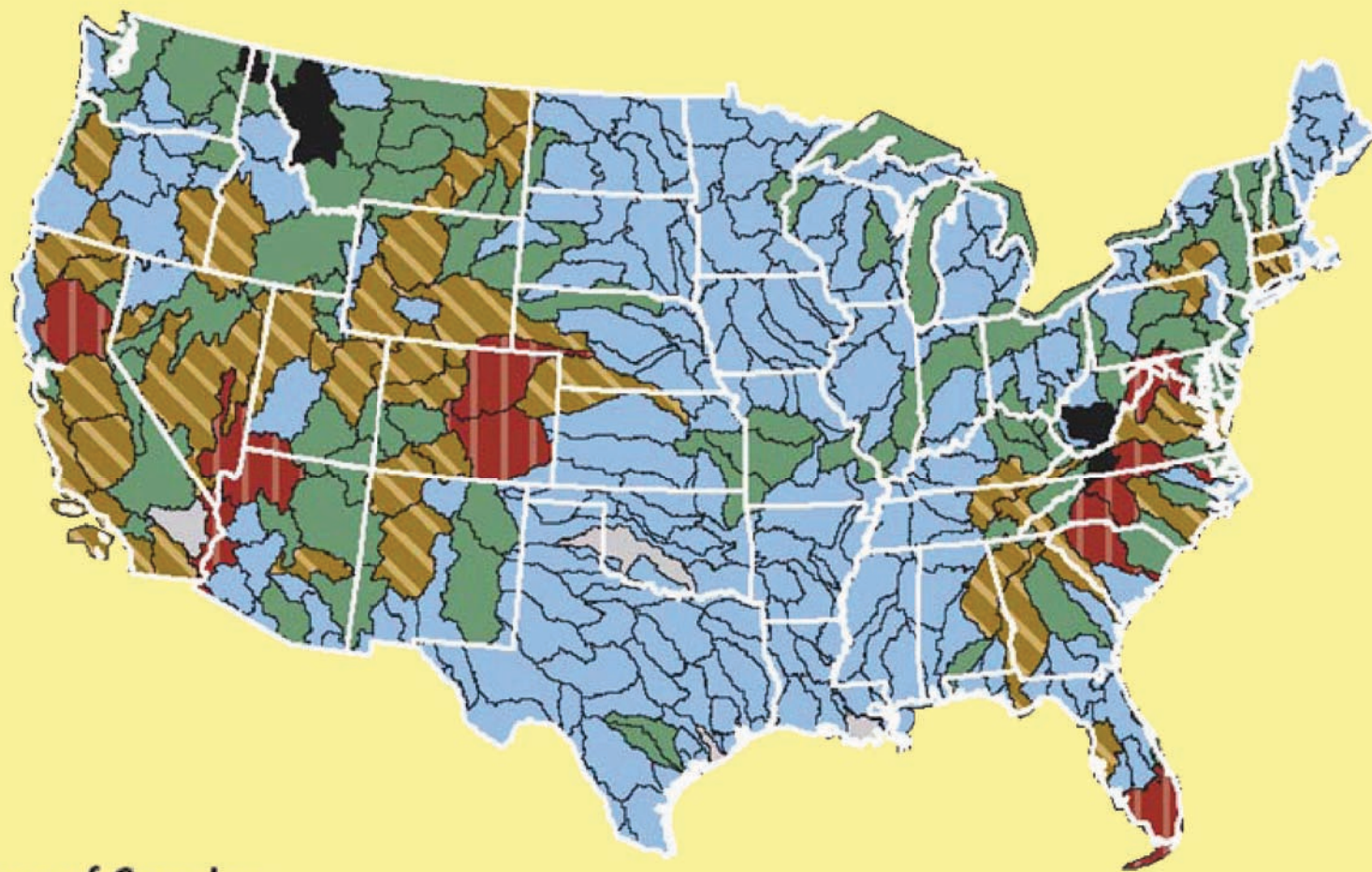
■ Freshwater and Wetland Plants

### Partial Indicator Data: Freshwater Animals



Source: NatureServe and its natural heritage member programs.  
Coverage: all 50 states.

# Established Non-native Fish Species, 2000



Number of Species

0

11-20

31-40

1-10

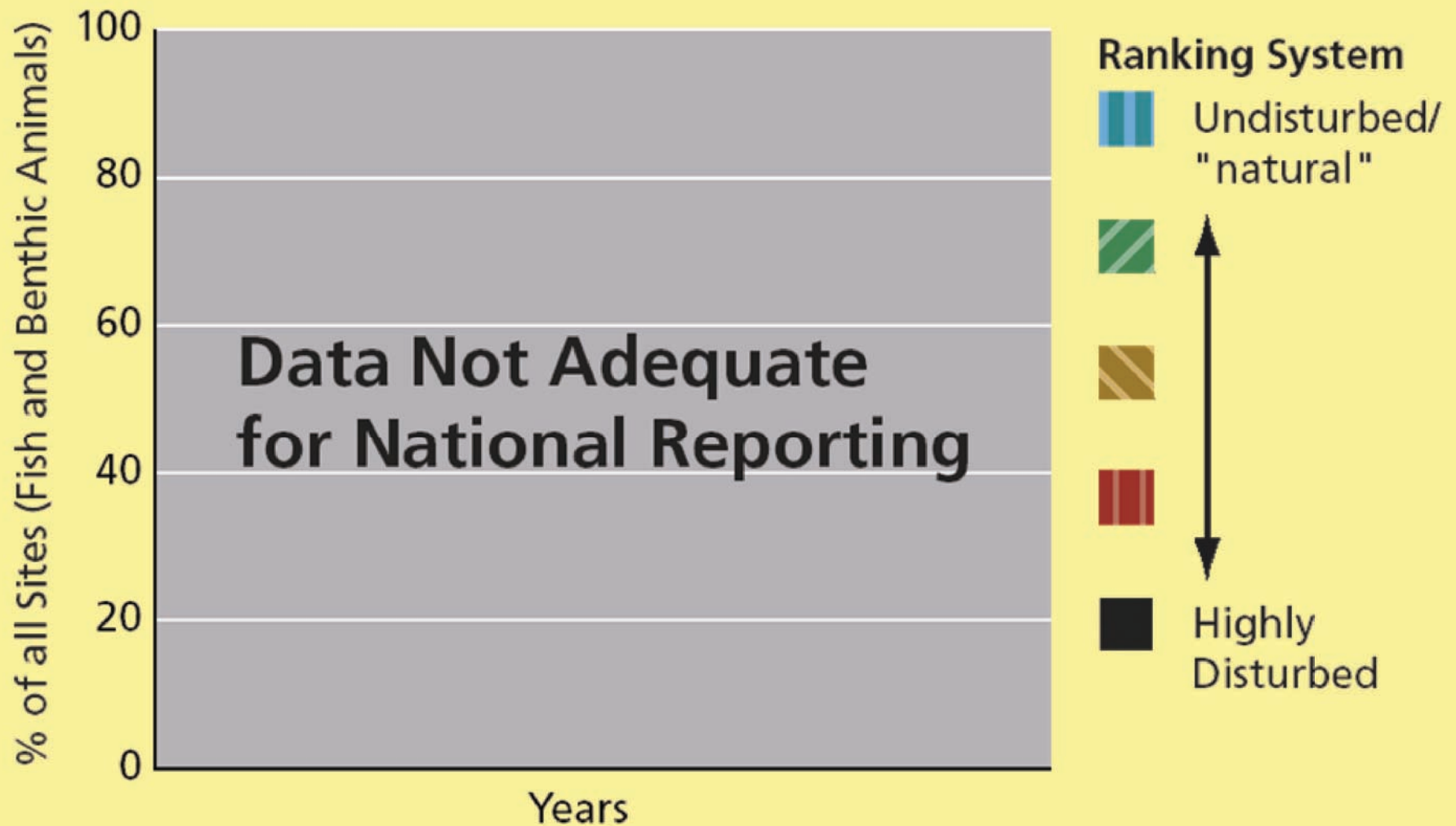
21-30

41-50

*Data Source: U.S. Geological Survey. Coverage: lower 48 states only.*

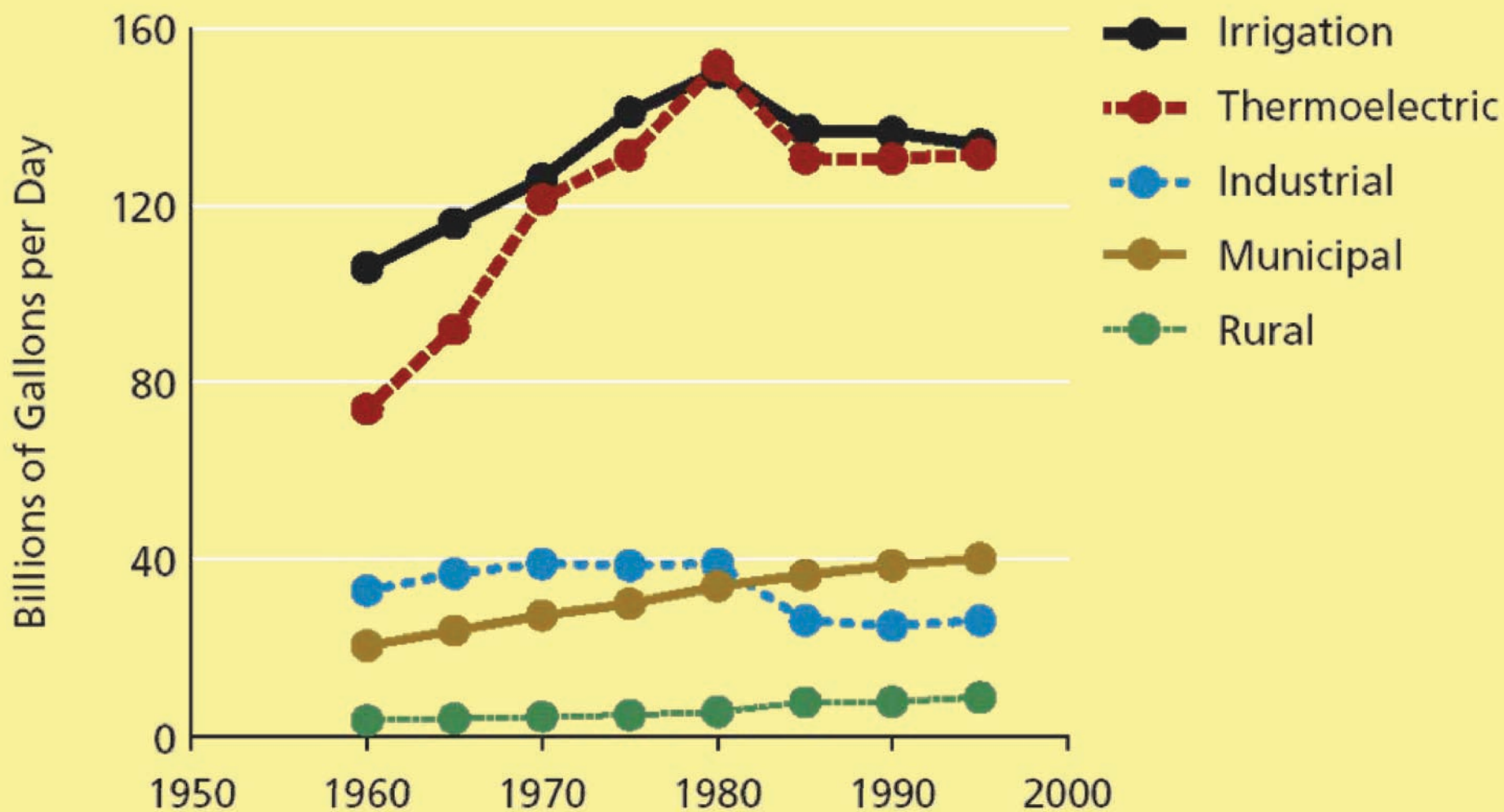


# Biological Community Integrity



*Note: When data are available, this graph would be complemented by maps showing the percentage of watersheds with fish and bottom-dwelling animal communities resembling those in undisturbed conditions.*

# Freshwater Withdrawals by Use



Data Source: U.S. Geological Survey. Coverage: all 50 states and U.S. territories.

**Indicator Development Needed**

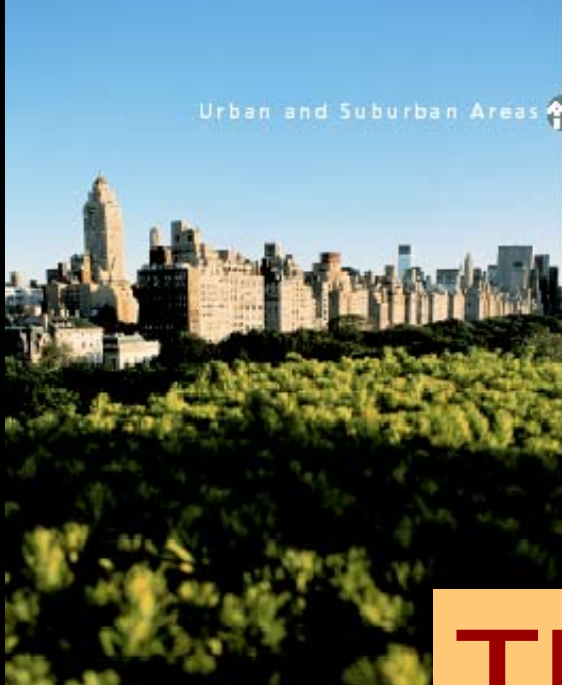
# What to do?

1. Basic system understanding
2. Distill knowledge >> indicators
3. Provide context
4. Keep the lines open





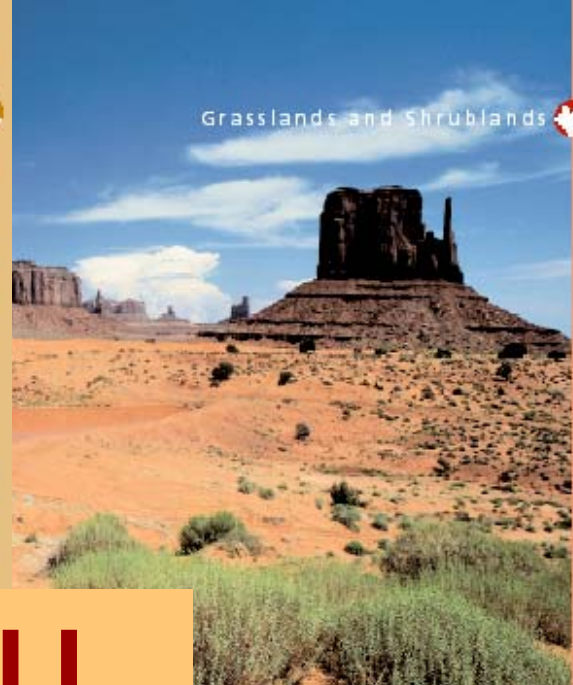
Urban and Suburban Areas



Farmlands

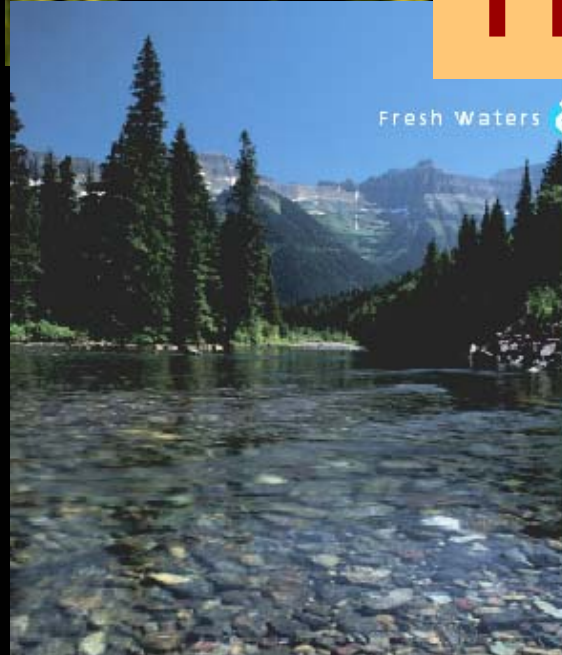


Grasslands and Shrublands

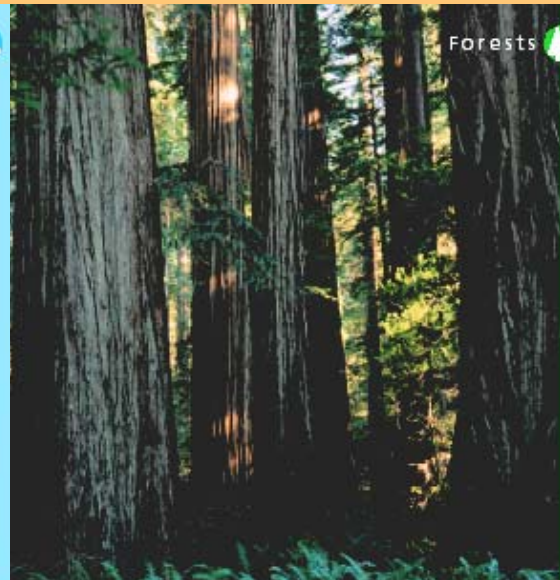


**THANK YOU...**

Fresh Waters



Forests



Coasts and Oceans



[www.heinzctr.org/ecosystems](http://www.heinzctr.org/ecosystems)